WorldCat: Medicare participating heart bypass center demonstration

OCLC	749969042			**HEC Holdings - no other holdings**							
Books	**Rec Stat**	n		**Entered**	20110906		**Replaced**	20110906130748.6			
Type	a	**ELvl**	I	**Srce**	d		**Audn**		**Ctrl**	**Lang**	eng
BLvl	m	**Form**		**Conf**	0		**Biog**		**MRec**	**Ctry**	mau
		Cont	b	**GPub**	o		**LitF**	0	**Indx**	0	
Desc	a	**Ills**		**Fest**	0		**DtSt**	s	**Dates**	1998,	

040 HEC ‡c HEC
090 RD598.35.C67 ‡b M43 1998
090
049 HECA
245 00 Medicare participating heart bypass center demonstration : ‡b executive summary : final report / ‡c prepared by Jerry Cromwell ... [et al.]
260 Waltham, Mass. : ‡b Health Economics Research, Inc. ‡c [1998]
300 25, [1] leaves ; ‡c 28 cm.
500 Supported by HCFA contract no. 500-92-0013.
500 "July 24, 1998."
504 Includes bibliographical references (leaf R-1).
650 0 Coronary artery bypass ‡z United States ‡x Costs.
650 0 Transluminal angioplasty ‡z United States ‡x Costs.
650 0 Hospitals ‡x Prospective payment ‡z United States.
650 0 Physicians ‡x Salaries, etc. ‡z United States.
650 0 Bundling (Marketing) ‡x Cost effectiveness.
650 0 Medical care, Cost of ‡z United States.
650 0 Medicare beneficiaries.
650 0 Medicare ‡x Costs.
700 1 Cromwell, Jerry.
710 1 United States. ‡b Health Care Financing Administration.
710 2 Health Economics Research, Inc.

Action Status Delete Holdings _ Export **C** Label _ Produce _ Update Holdings **C** Validate _

HEALTH ECONOMICS RESEARCH, INC.

411 Waverley Oaks Road, Suite 330
Waltham, MA 02154-8705
(781) 788-8100
(781) 788-8101 - FAX

Medicare Participating Heart Bypass Center Demonstration

Executive Summary

Final Report

Prepared by:

Jerry Cromwell, Ph.D.
Debra A. Dayhoff, Ph.D.
Nancy T. McCall, Sc.D.
Sujha Subramanian, Ph.D.
Rachel C. Freitas, B.A.
Robert J. Hart, B.A.

Health Economics Research, Inc.

With:

New England Research Institutes

Cheryl Caswell, M.B.A.

and:

William Stason, M.D., M.P.H.

Prepared for:

Armen H. Thoumaian, Ph.D., Project Officer

Health Care Financing Adminstration

July 24, 1998

This project was funded under HCFA Contract No. 500-92-0013. The statements contained in this report are solely those of the authors and do not necessarily reflect the views or policies of HCFA. The contractor assumes responsiblity for the accuracy and completeness of information contained in this report.

Executive Summary

Rationale for the Demonstration

In 1980, the federal government spent $36.4 billion on the Medicare program (Letsch *et al.,* 1992, Table 4). By 1991, the figure had reached $120.2 billion, an average increase of 11.4% annually. For hospital care alone, the federal Medicare Program spent $26.4 billion in 1980 versus $73.3 billion in 1991 (Letsch *et al.*, 1992, Table 21). Spending on physician services rose even faster from $7.9 billion in 1980 to $32.8 billion in 1991.

The Health Care Financing Administration (HCFA) has been very active in responding to these high rates of program outlays. On the hospital side, the Congress passed Tax Equity and Fiscal Responsibility Act (TEFRA) legislation in 1982 that put per case ceilings on hospital reimbursements. Then, a year later, it passed Diagnosis Related Group (DRG) prospective payment for all short-term acute hospitals receiving Medicare payments. In terms of physician reimbursement, the Congress passed, and HCFA implemented, the physician fee freeze in the mid-1980s, followed by overpriced procedure rollbacks in the late 1980s, and, finally, the Medicare Fee Schedule in the early 1990s designed to link payments more closely to work effort and the costs of each service.

Besides legislated reform, HCFA also has undertaken many cost containment demonstrations. One approach involved negotiating global payment rates for all Medicare hospital insurance (Part A) and Medicare medical insurance (Part B) inpatient services associated with coronary artery bypass graft surgery (CABG). Expenditures on heart bypass surgery have been particularly worrisome. Every year, the government spends several billion dollars on the inpatient care for bypass patients. With the implementation of DRG per case payment to hospitals in 1983, the Part A payment amount for bypass surgery has been capped at the annual update in Medicare hospital rates nationally. However, the growth in Part B physician outlays remained unconstrained, except for rollbacks on the surgeon's fee. Mitchell

(1993) estimates that total Medicare allowed charges grew 12-14% annually for bypass surgery from 1985-88, even after adjusting for updates in allowable fees.

A major concern of both hospital managers and policy makers in controlling inpatient costs for high-tech procedures is the asymmetry of financial incentives faced by hospital managers versus physicians. Currently, hospitals are paid for bypass surgery on a per case basis (primarily within DRGs 106 and 107). Except for extraordinary outlier costs, they are paid a fixed amount regardless of the intensity of care provided each patient. Although surgeons, like hospitals, receive a bundled fee for inpatient surgery and visits, other physicians, by contrast, are paid for every additional service they provide, including routine daily hospital visits and consultations. Surgeons, too, are paid more for more complicated surgeries requiring more bypassed lesions or related procedures. Moreover, all hospital inputs are essentially "free" to physicians because they bear none of the financial risk of keeping patients in the intensive care unit (ICU) longer, or using more expensive drugs, etc. So long as physicians operate under different payment incentives that encourage more services, hospital managers will have difficulties implementing efficient practice patterns. A global fee that includes physician services would align incentives and encourage physicians to use institutional resources and any consulting physicians in a more cost effective manner.

Overview of Demonstration Design

In 1988, the Health Care Financing Administration solicited bids from hospitals and physicians to participate in the Medicare Participating Heart Bypass Center Demonstration. In response to a solicitation mailed to 734 hospitals, HCFA received 209 pre-applications. After initial review, 42 hospitals were requested to submit extensive formal applications that detailed their qualifications and bypass volumes. Applicants were then asked to give their best price covering all inpatient institutional and physician services for Medicare patients discharged in DRGs 106 and 107, bypass with or without catheterization. Twenty-seven entities submitted bids, and an expert panel of multi-disciplinary experts including physicians

recommended ten finalists. At this point, Agency staff, with the assistance of staff from Lewin-VHI and Health Economics Research, the evaluation contractors, conducted an in-depth evaluation of each proposal. Ten criteria were used to rank applicants based on quality and price considerations. (See Chapter 3 of the full report for details.) HCFA administration then negotiated contracts with four applicants:

- Saint Joseph's Hospital of Atlanta;
- St. Joseph Mercy Hospital in Ann Arbor;
- The Ohio State University Hospitals in Columbus;
- University Hospital in Boston.

These sites were chosen based on price and other factors, including geographic dispersion. The intent was to maximize the policy information derived from the novel payment arrangement as well as to test the feasibility of negotiating and then paying bundled global rates. Negotiated global bundled payment prices were established that represented varying discounts to Medicare.

Under the demonstration, Medicare paid each of these applicants a single global rate for each discharge in DRGs 106 and 107. This rate included all inpatient hospital and physician services. The standard Medicare hospital pass-throughs were also included on a prorated basis, i.e., capital and direct medical education. Any related readmissions were also included in the rate. Pre- and post-discharge physician services were excluded except for the standard inclusions in the surgeon's global fee. All four participants agreed to forego any outlier payments for particularly expensive cases. However, an estimated outlier amount based on each hospital's previous experience was included on the global price.

Hospitals began receiving payments in May and June of 1991. The length of the demonstration initially was set at three years, ending in June of 1994. Participants were required to assemble all physician bills along with the hospital discharge abstract and submit the package to HCFA Central Office for payment. The hospital and physicians were free to divide up the single payment any way they chose. Rates were updated annually according to existing Medicare hospital prospective payment and physician fee schedule rules.

Applicants were required to collect a predetermined financial obligation from Medicare patients. This included any Part A hospital and Part B physician deductibles plus the 20% Part B coinsurance. Ordinarily, the coinsurance amount varies by the amount of physician services each patient receives, but under the demonstration the Agency set a fixed actuarial amount per discharge adjusted to be below the (estimated) negotiated Part B amount for a typical admission.

The government placed few requirements on participants other than those already imposed by the program. Hospitals were still subject to the usual utilization review activities that monitored necessity for admission. Physicians were not allowed to balance bill patients, nor could they bill for outpatient services normally included in their global inpatient fee. When the Agency reclassified most DRG 108 bypass patients back into DRGs 106 and 107 in 1992, these patients became part of the demonstration as well. Similarly, when the Congress passed the Medicare Fee Schedule that rolled back many surgical fees, the Agency made downward adjustments in the Part B component of the global rates.

Unlike the current Medicare program, the Agency required that it have the right to review and approve any promotional materials used by the hospitals and physicians under the demonstration. One of the marketing strategies proposed by applicants was to forego the deductible and copays for patients without supplemental insurance. The Agency finally ruled against this request on the grounds that it would discriminate against third-part insurers (and their subscribers) who would still be liable. Providers were not willing to forego deductibles and copays on all demonstration patients.

In the spring of 1993, the government expanded the demonstration to include three more participants:

- St. Luke's Episcopal Hospital in Houston;
- St. Vincent's Hospital in Portland, Oregon;
- Methodist Hospital in Indianapolis.

All six of the remaining ten applicants from the first round were invited to submit new bids, but only St. Luke's, St. Vincent's, and Methodist Hospitals did so. These hospitals began

receiving payments in the second quarter of 1993 under three-year contracts. The original four hospitals all agreed to continue being paid global rates under the demonstration after their contracts ended in the summer of 1994. This expansion extended the evaluation period through the second quarter of 1996, allowing 5 and 3 years, respectively, for the original and additional sites.

Evaluation Issues

Many issues were addressed in the evaluation. Some of the more important ones included:

- **Feasibility of Bundled Payments.** Was it possible for the government to negotiate discounts with providers that included both hospital and physician services? Could this process be fair and efficient? What reporting requirements were required on the government's part? On the provider side, would hospitals and physicians be able to work together and submit a single packaged rate?

- **Volume Growth**. Did the imprimatur of being named a Medicare Participating Heart Bypass Center result in increased bypass volumes among the participants? How did participants promote the demonstration? Did they increase volume at the expense of local competitors? How did competitors react to the demonstration?

- **Program, Beneficiary, and Hospital Savings**. How large were the discounts that the government negotiated with participants? How much did Medicare beneficiaries (and their insurers) benefit as a result of the discounts? Did practice patterns change lowering hospital costs?

- **Patient Outcomes**. Did patient outcomes change under the demonstration, as measured by inpatient mortality and complication rates? Did one-year post-discharge outcomes change, as measured by mortality, angina relief, and readmissions?

- **Appropriateness of Care**. Did the overall level of appropriateness of care change under the demonstration? What was the extent of disease among demonstration patients and how did that change over the demonstration period?

- **Patient and Hospital Management**. Did physicians change the way in which they managed patients in the hospital under the demonstration? Were there any changes in the use of consulting physicians under a single fixed global payment? Did hospitals introduce significant management changes to lower costs and improve service efficiency over-and-above changes in patient management?

- **Marketing, Managed Care, and Beneficiary Awareness**. How did participants market their selection as a demonstration hospital? Were participants in a better position to compete for managed care contracts because of the demonstration? How did competitors respond in their marketing efforts? Did the hospitals' marketing efforts affect patient awareness and decisions of referring physicians?

- **Physician Payments**. Once the hospital received the bundled payment, how was it divided up between the institution and physicians? How were consulting physicians that were not routinely involved in a case reimbursed? Did physicians share in any of the cost savings that may have resulted from changes in their practice patterns?

- **Reimbursement Difficulties**. What problems did participants encounter in receiving payment from the government? What problems did they encounter in billing third-party payers for the supplemental insurance?

- **Achievement of Goals**. How satisfied were hospitals and physicians with the demonstration? Did they feel that the demonstration helped them gain volume and market share? Did they feel that the alignment of incentives led to significant improvements in hospital and patient management? Did they believe that the demonstration resulted in a closer working relationship between the hospital and clinical staffs?

Evaluation Approach

To provide answers to these questions, the Health Care Financing Administration initially contracted with Lewin-VHI and Health Economics Research (HER). Their interdisciplinary staff of economists, physicians, and marketing experts were responsible for assembling a variety of data bases and conducting numerous on-site interviews with participants as part of an extensive quantitative and qualitative evaluation of the program.

Staff also assisted HCFA in the evaluation of the bids of the original ten finalists. Then, in 1995, the Agency awarded a contract to HER for an extended evaluation to cover the remaining years of the demonstration. HER, in turn, contracted with The New England Research Institutes (NERI) to conduct surveys of beneficiaries and referring physicians.

Databases. The principal data bases used in the evaluation included:

- all MedPAR discharge records for DRGs 106, 107, and 108 for seven years, 1990-96;
- all National Claims History Part B claims for patients identified on the MedPAR files;
- detailed hospital micro-cost information on each patient;
- detailed medical records information on each demonstration patient;
- follow-up patient outcome status one year post-discharge;
- the Medicare enrollment file information on all demonstration patients;
- angiographic films and reports for a sample of 120 patients in six sites;
- detailed patient volumes, marketing, and referral information from all seven sites;
- primary surveys of patients and physicians.

National Bypass Trends. The Medicare claims were used to document national trends in Medicare bypass (and angioplasty) volumes, patient demographics, lengths of stay, mortality rates, and costs. Physician costs were decomposed into three segments representing 30 days prior to bypass surgery, inpatient, and 90 days post-discharge.

Market Shares. When subsetted to the demonstration hospitals and their competitors in local markets, the claims data supported quantitative analyses of shifts in market shares between 1990, the baseline year, and 1996, the last year of the demonstration.

Medicare Savings. Negotiated prices were compared with predicted Medicare prospective payment rates and physician inpatient outlays to derive the immediate savings from the demonstration. To test for shifts in services post-discharge, claims associated with demonstration patients 30-days prior and 90-days post-discharge were compared with what might have been expected in lieu of the demonstration. Finally, any market share savings were derived by taking the difference between the negotiated prices and what other

competitors were being paid by Medicare and multiplying by the shift in cases.

Patient Costliness. The micro-cost information was used to evaluate trends in institutional costs and profits on demonstration patients. Average total and variable costs were derived, then compared, showing overall gains in costliness and profits per case. Per case costs, within DRG, were also decomposed by department to isolate the source of any efficiency gains.

Patient Outcomes. Every demonstration hospital provided a set of clinical information on each patient (over 10,000) throughout the demonstration period, including discharge status (died, other), risk indicators, comorbid conditions, admission priority, type of coronary heart disease, age, gender, height, whether they had had a previous bypass operation, and ejection fraction. Additional information was provided on disease anatomy (e.g., number of lesions) and intra- and post-operative complications (e.g., return to the operating room for bleeding). Extensive descriptive analyses were performed comparing the seven hospitals in terms of mortality, stratified by risk factor and other relevant variables. Logistic analyses were then conducted explaining inpatient mortality, complication rates, and lengths of stay using a monthly time trend over the demonstration period. The mortality analyses were extended to 90-day and one-year follow-up using the Medicare enrollment files. To further supplement the analysis, Medicare claims data were used to construct patient risk factor profiles in all demonstration and competitor hospitals.

Patient Satisfaction and Health Status. Because detailed medical records data were not available from a set of control hospitals, a primary care survey was conducted on a sample of bypass discharges from demonstration and competitor hospitals at a point in time. The survey included questions on the reasons patients and referring physicians selected a particular hospital for surgery, how satisfied they were with the attention and care they received, and their health status before and after the operation.

Appropriateness of Care. To test for any changes in the appropriateness of bypass surgery, a panel of clinical experts was convened to rate the appropriateness of bypass surgery along several dimensions, including clinical presentation and surgical risk. These ratings were merged onto the clinical data base and descriptive and multivariate analyses were used to test the change in appropriateness ratings depending upon the period in which the patient was discharged.

In-depth Case Studies. In addition to the quantitative analyses using primary and secondary data, a team of three evaluators visited all seven sites once and the four original sites a second time for in-depth interviews with managers and clinical staffs. These interviews were designed to fill in the gaps and help explain the results of the quantitative analyses. Interviews were conducted with hospital CEOs, COOs, CFOs, demonstration managers, department managers, marketing and managed care directors, billing/collection personnel, operating room and floor nurses, and utilization review and quality of care directors. Interviews were also conducted with thoracic surgeons, cardiologists, anesthesiologists, catheter lab clinicians, and other consulting physicians. To supplement interviews in the demonstration hospitals, interviews with managers and physicians were conducted in two competitor hospitals. (Attempts to interview competitors in the two other original sites were unsuccessful.) These interviews focused on marketing and competitive issues.

Summary of Findings

- ***National Trends in Medicare Bypass Surgery***

The number of Medicare heart bypass cases in the United States grew by 40 percent between 1990 and 1996, with over 180,000 procedures performed in the latter year. Over the seven-year period, 1990-96, total Medicare program costs on bypass surgery alone increased by roughly $2.8 billion to **$7.3 billion by 1996**. This estimate includes not only an extra $1.9 billion in hospital payments, but a **175% increase in 90-day post-discharge outlays** as well. **Home health costs grew four-fold and skilled nursing costs increased eleven-fold over the period**.

National Medicare inpatient mortality rates fell from 1990 through 1996 by one percentage point to 5.4% in 1996. Rates were 1.5 points higher in small (under-200 bed) hospitals. Significant differences in inpatient mortality rates exist across hospitals more generally. Ten percent of the roughly 900 bypass hospitals have mortality rates less than 2% versus another 10% with rates above 9.0%. Hence, issues of quality and regionalization of bypass surgery in larger hospitals provide a strong motivation for the demonstration.

Substantial reductions in inpatient stays also took place while mortality rates were falling. As recently as 1990, the average Medicare bypass stay was 15 days. Six years later, it had **fallen to 9.9 days**. Yet, as with mortality rates, variation in lengths of stay of nearly a week remained between the top and bottom 10% of hospitals.

Despite shorter stays, **Medicare outlays per case for bypass surgery**, including a 90-day post-discharge follow-up period, **rose 15% over six years to $40,124**. Inpatient costs, including associated physician services, rose $2,148 to $31,582; post-discharge costs rose by $2,780. When hospital location, size, and patient age and gender are controlled for, surgery in **major teaching hospitals cost the government almost $9,000 more** than in nonteaching hospitals, including both institutional and physician bills.

- ***Feasibility of Bundled Payment***

The federal government received 209 letters of interest to its initial request for bids to bundle both Medicare Part A hospital and Part B physician services. Forty-two qualified bidders were recommended by the pre applicant review panel to apply; 27 responded with full bids. Of these, four hospitals were chosen initially, later expanded to seven. Thus, it is clear that **many hospitals can work jointly with their medical staffs to develop a single bid offering the government meaningful discounts. All successful applicants were also willing to forego any outlier payments and balance billing, thereby bearing all the risk for costly cases.**

Without question, substantial data are required on the applicant's part to establish a bid for all services. The Health Care Financing Administration also requires all hospital and physician bills associated with previous discharges from applicants in order to evaluate the discounts being offered. Fortunately, **HCFA's new 100% claims files support such detailed evaluation**.

- ***Volume Growth***

During the course of the demonstration, **Ohio State University Hospital and St. Joseph Mercy Hospital in Ann Arbor experienced statistically significant increases in Medicare bypass market shares.** University Hospital in Boston had a significant decrease in its share while St. Joseph's Hospital in Atlanta increased market share mid-demonstration before losing these gains by 1995, in spite of achieving a large gain in volume, overall. Among the three new participants who entered the demonstration during 1993, **all three sites experienced a statistically significant decline in market share during the course of the demonstration.**

All seven hospitals exhibited DRG proportions that differed from their local competitors. Hospitals in Atlanta, Boston, Portland, and Houston had disproportionately more DRG 107 referral patients than their competitors, implying that they serve more as referral institutions. Hospitals in Columbus and Ann Arbor had higher proportions of cases in DRG 106 compared to their competitors.

Controlling for DRG mix and patient age and gender, **St. Joseph's Hospital in Atlanta had inpatient stays that averaged 2.8 fewer days than among competitor hospitals. St. Vincent's Hospital in Portland averaged 2.4 fewer inpatient days.** Both St. Joseph Mercy in Ann Arbor and Methodist in Indianapolis had lengths of stay 1.5-2 days shorter on average. **All seven hospitals exhibited strong declines in lengths of stay ranging from one-half to one full day per year.** Only Methodist Hospital, however, had declines in stays that exceeded the downward trend taking place among local competitors.

- ***Program, Beneficiary, and Hospital Cost Savings***

From the start of the demonstration in May-June, 1991, through its conclusion in June, 1996, the **Medicare program saved $42.3 million on bypass patients** treated in the demonstration hospitals. **The average discount amounted to roughly 10% on the $438 million in expected spending on bypass patients, including a 90-day post-discharge period.** Eighty-six percent of the savings came from HCFA-negotiated discounts on the Part

A and B inpatient expected payments. Another 5% came from lower-than-expected spending on post-discharge care, while 9% came from shifts in market shares in favor of lower-cost demonstration facilities.

In addition, **beneficiaries (and their insurers) saved another $7.9 million** in Part B coinsurance payments. Thus, **total Medicare savings are estimated to have been $50.3 million in five years.**

St. Joseph's Hospital in Atlanta generated $15.0 million in program savings; the most of any hospital. Of this total, $8.0 million came from negotiated discounts and another $4.1 million from post-discharge savings. Savings from its gain in market share accounted for an additional $2.9 million. University Hospital and St. Joseph's Hospital in Ann Arbor generated $7.0 million and $10.0 in savings, respectively. Ohio State University Hospital generated $5.4 million in savings, the least of the original four hospitals, in spite of the fact that it had by far the largest negotiated inpatient discount per case (roughly $10,000 including teaching costs and other pass-throughs in the early years of the demonstration). It also treated the fewest demonstration patients. Among the expansion sites, program savings over the course of the demonstration ranged from $1.7 million at Methodist Hospital in Indianapolis to $2.1 million at St. Vincent's Hospital in Portland.

The demonstration clearly saved the program money, but what about hospitals that offered discounts to participate? Did the alignment of physician and hospital incentives result in less costly care as well as lower program costs? **Three of four original hospitals were able to make major changes in physician practice patterns and hospital operations that generated significant cost savings.** St. Joseph Mercy Hospital and St. Joseph's Hospitals, along with University Hospital in Boston, experienced absolute decreases in per case costs ranging from 2% to over 23% between 1990 and 1993, depending on DRG and hospital. The Atlanta hospital had the highest average reduction: 9-13% per case in the two DRGs. Assuming 5% annual inflation in hospital input wages and other prices, one could expect a three-year increase of over 15%, not counting the secular trend towards more intensive care of older patients with more coronary vessel disease. Thus, the reductions in

real resource costs in three hospitals may have ranged between 18% and 40%. Ohio State University Hospital, by contrast, experienced average cost increases in both DRGs of 10 to 24%. After adjusting for expected inflation, however, these rates are not exceptionally high.

The three hospitals with declines in average costs experienced statistically significant declines of 10-40% in direct ICU and routine nursing expenses. The two nonacademic medical centers also had **significant declines of roughly 30% in pharmacy costs per case.** Laboratory costs fell between 20 and 60%. Operating room costs, by contrast, rose 10-20% across all institutions, but, again, this is not controlling for wage and other price increases.

Declining costs per case in Atlanta resulted in increases in average profit margins of $3-4,000 from 1990 to 1993. St. Joseph Mercy achieved an $8,500 increase in DRG 106, although margins fell by $1,300 in DRG 107 even though costs fell slightly. Ohio State University Hospital experienced major declines (=$7-10,000) in average per case margins due to a combination of sizable initial discounts to HCFA, no updates for three years, and 10-24% increases in per case costs.

Average margins reflect long-run profitability per case. What is more important to financial managers is short-run profitability based on variable margins. A demonstration patient will be profitable if payment more than covers the additional costs incurred plus contributing something towards fixed costs. On this basis, **all four original demonstration hospitals enjoyed significant positive variable margins.** St. Joseph's Hospital in Atlanta increased its variable margins by 80-111% while St. Joseph Mercy in Ann Arbor increased its DRG 106 variable margin by 62%. By contrast, the **two academic medical centers saw their variable margins decline** (although remaining positive) by 12-19% in University Hospital and 45-68% in Ohio State University Hospital.

- ***Patient Outcomes***

By the end of 1996, over 10,000 discharges were available for testing demonstration effects on clinical outcomes. **Holding many patient risk factors constant, a statistically**

significant, negative, trend in inpatient mortality rate was found among demonstration hospitals. Although somewhat sensitive to included risk factors, the best estimate is an average annual decline in mortality of approximately 8 percent, or slightly less than half a percentage point around an overall mean of 5 percent. **The seven demonstration hospitals together also had a much lower overall inpatient mortality rate (4.6% averaged over 1991-96) compared with Medicare national rates (6.5% in 1990; 5.4% in 1996)**. Lower-than-average baseline mortality rates make the estimated decline in mortality rates among demonstration hospitals all the more impressive.

Statistical differences were found in inpatient mortality rates among some of the seven demonstration hospitals, even after controlling for patient severity and other risk factors. Key risk factors controlled for included whether the patient had had a previous bypass, in which case the risk of dying was approximately 3 times higher, whether the insertion of a balloon pump was required (also tripling the risk of dying), or was admitted on an emergency basis (3.2 times more likely to die), or over 80 years old (twice as likely to die), or being admitted with renal disease (2.1 times more likely to die). **Risk-adjusted inpatient mortality exhibited a 4-fold difference across demonstration sites**. However, **the two sites with above-average mortality rates experienced statistically significant declines over the demonstration period.**

Over the course of the demonstration, there was **some evidence of a growing severity in case mix**, including a higher percentage of patients over 80 years of age with more comorbid conditions undergoing their second bypass.

One-year cumulative mortality after bypass surgery in demonstration hospitals averaged approximately 50 percent higher than inpatient mortality. However, based on demonstration patients discharged through December 31, 1995, **one-year, post discharge mortality rates in participating hospitals declined 8 percent on an annual basis**, almost identical to the inpatient mortality decline.

Multivariate analysis also showed a significant impact of post-operative complications on inpatient mortality rates. Renal failure, for example, increased the risk of

dying by approximately 5-fold and strokes by 2.3-fold while return to the operating room for bleeding increased the likelihood by 1.8-fold. These complications, naturally, were only controlled for after interpreting the trend and hospital differences separately. **A small positive trend in the rate of reported complications was found over the demonstration period (at the 10% confidence level).** This was true controlling for patient pre-operative risk factors. The estimated rate, however, was quite small, i.e., 2.4 percent annually. Any increase in reported complications apparently was offset by better clinical care during the stay, as mortality rates fell even allowing for increasing complications. It is also quite likely that most patient complications are outside the hospital's and surgeon's control and may have been increasing in frequency due to unmeasured changes in patient severity. Assuming complications are out of the clinician's control and treating them like additional risk factors results in a 10 percent annualized decline in inpatient mortality.

Inpatient mortality models based on claims data were found to predict the likelihood of death in demonstration hospitals almost as well as models using medical records abstracts (68% versus 72%, respectively). **The significant downward mortality trend in demonstration hospitals was unaffected by the data source used to quantify patient risk factors.**

Both demonstration and competitor hospitals were found to have a statistically significant declining mortality trend controlling for claims-based risk factors. Of the seven demonstration market areas, four exhibited statistically significant declining mortality rates; none had rising rates. One demonstration hospital's mortality rate fell significantly faster than its competitors', which was also declining. **No demonstration hospital's mortality rate rose relative to its competitors over the demonstration period.**

- *Appropriateness of Care*

Under the assumption that no demonstration patients were viable candidates for angioplasty, 97.7% of the bypass operations among all seven hospitals fell into the appropriate range according to the criteria of an expert panel of surgeons and cardiologists.

If every patient were assumed a candidate for angioplasty, then only 72.7% of operations would have been deemed appropriate, the rest being equivocal or inappropriate. Alternatively, **0.1 percent of patients could be considered inappropriately operated on if not a candidate for angioplasty versus 3.7% if all were candidates.**

No significant time trend was found in the overall average appropriateness rating of patients discharged from the four original hospitals, regardless of whether they were candidates for angioplasty or not. Statistically significant differences were found in the average appropriateness level among the four hospitals but were of little clinical relevance due to their small absolute size.

Coronary angiography results are one of the major determinants of the choice of treatment for coronary artery disease as well as the overall necessity of intervention. A separate, blinded, evaluation of 119 angiogram films from six of seven hospitals in 1993 found that **hospitals' estimates of the extent of stenosis, or occlusion, was significantly greater than those based on quantitative angiography. Hospitals' overestimates varied inversely with the degree of stenosis,** with more accurate readings at higher levels of occlusion.

- ***Hospital Choice, Satisfaction, and Health Improvements***

Only a small minority (6-7%) of the patients treated in the demonstration and competitor hospitals reported considering the possibility of being treated in another hospital apart from the one they selected. **Thus, overall, bypass patients rarely engage in any comparative analysis of hospitals prior to making their selection.** The patients learned about the reputation of the hospital they chose from several sources. About half of the patients heard about the reputation of the hospital from their physician and another third from family members or friends. Very few patients heard about the hospital from the media. The most important factors affecting patient choice of hospital were the overall reputation of the hospital, the reputation of the heart surgery program, and advice of their referring physician. However, **cost of surgery was a more important consideration for demonstration**

patients compared to non-demonstration patients, while location of the hospital was a more important factor in the choice for the non-demonstration patients. **Among demonstration patients, 36 percent knew about the demonstration status of the hospital** while only 19 percent of the non-demonstration patients had this same knowledge (significant at the 1 percent level). However, **only 32 percent of the demonstration patients who knew about the demonstration responded that knowledge of the demonstration status of the hospital affected their decision to use the demonstration site.**

Two-thirds of referring physicians indicated they were aware of the demonstration status of the hospitals; however, this knowledge had little or no effect on physician referral patterns. The major factors affecting referring physicians' choice of hospital were their relationship with the hospital staff, the demonstrated superiority of surgical outcomes, and overall hospital reputation.

Patient satisfaction with care received at the hospital was high both in demonstration and competitor hospitals, but there is some evidence that the demonstration patients were more pleased with their experience. **A significantly greater proportion of demonstration patients reported they were "very satisfied" with the overall skill of the nurses and that their length of stay was appropriate**. This result is especially meaningful, given that demonstration hospital patients on average had shorter stays than their non-demonstration counterparts. **Demonstration patients also received fewer bills for their surgery and found the billing process to be easier than expected.**

Overall, there were no systematic differences in self-reported health outcomes between demonstration and non-demonstration patients. More than 50 percent of the demonstration and the non-demonstration patients reported their health to be excellent or very good after bypass surgery. About 75 percent of both demonstration and non-demonstration patients reported that the surgery helped them "a lot." In a few instances, patients who were admitted to the demonstration hospitals did appear to be in better health after surgery than those treated at competitor hospitals. For instance, demonstration patients

had fewer readmissions for heart-related problems and a higher proportion of them reported improvement in ability to walk and garden. Thus, we can conclude that **the bundling of the physician with the hospital payment did not have a negative impact on the post-discharge health improvements of the demonstration patients.**

- ***Patient and Hospital Management***

Three of four original demonstration hospitals made major improvements in their micro-cost data systems. A fourth hospital initially remained on the traditional departmental cost-to-charge system of patient cost finding. This caused serious problems working with surgeons in trying to change practice patterns. The three additional sites all had micro-cost systems and were in the process of linking costs to clinical information. **Only where hospitals could link specific services to patients and attach meaningful direct costs to them were they able to convince physicians of the need for more cost effective decision making**. Hospitals with detailed cost systems were able to conduct special studies in the operating room, the pharmacy, the ICU, and the catheter lab, that showed surgeons the frequency of brand and generic drugs, costly angiographic agents, etc.

Interestingly, few of the financial managers closely monitored the cost and profitability of demonstration patients. Rather, they hired an outside consultant to work with surgeons to change practice patterns. Comparative data from other hospitals provided by the consultant seemed crucial in supporting cost-effective drug substitutions and reductions in resource use.

A primary focus of patient care management was the four components of length of stay: admission to catheterization; catheterization to surgery; ICU length of stay; and post-ICU length of stay. As a result, **most hospitals reduced ICU stays by one full day and routine stays by another two to three days**. Hospital managers, nurses, and physicians agreed that **aligning surgeon with hospital incentives to reduce costs was absolutely critical in changing practice patterns and improving department efficiency**.

Most institutions made major staffing reductions over the course of the demonstration in response to declining inpatient utilization. Shorter ICU stays meant more turnover and fewer nursing days per patient. Early extubation and quicker ambulation were key factors. Hospitals also introduced a **major innovation by designating Clinical Nurse Specialists to be in charge of each bypass patient's stay**. Their main job was to assure a smooth transition from service to service, to avoid costly complications, to prepare patients and families for early discharge, and to improve communications among specialists making clinical decisions. They also reviewed standing orders and recommended changes. It is interesting that specialists in other areas such as orthopedics resisted hospital attempts to introduce nurse specialists. Managers felt that other specialists had no financial incentives to change their practice patterns.

Another novel change was the implementation of **same-day surgery for DRG 107** patients who had their diagnostic catheterization performed elsewhere. Again, physician incentives to avoid an extra day's stay helped, although many clinicians now seem challenged to get patients in and out of the hospital as quickly as possible regardless of payment methods.

Pharmacists cited **several drug substitutions** that explained the savings reported earlier. One hospital reported saving $50,000 annually in cardioplegic solutions during surgery. Two other hospitals were saving $100,000 per year by substituting generic for brand narcotics. Twenty to forty thousand dollars was saved in vasopressors, anti-coagulants, and diuretics at a couple of participating hospitals. Pharmacists emphasized the importance of having the surgeon support, inviting them to meetings, discussing possible substitutions, and asking for special studies.

Operating room managers observed a significant increase in the complexity of bypass surgery which they ascribed to angioplasty and fewer single and double-vessel bypasses. Nevertheless, they saw improvements in operating room times. Bypass operations that used to take 8.5 hours in 1992 were taking 5 hours in 1994, for example. Furthermore, due to improvements in angioplasty and the rapid growth in the frequency of stents, none of the

hospitals kept an operating room and surgical team standing by any longer for failures. Now, the operating room is on a next-available basis.

Efficiencies have been realized in the catheter lab as well, beginning with the substitution of ionic for nonionic contrast agents. One hospital saved $500,000 annually by using the cheaper agent half the time, without adverse reactions. With the cardiologists' support, catheterization lab managers have been able to narrow the number of device vendors from seven to two, thereby increasing their negotiating power and getting greater discounts.

- ***Marketing Programs and Local Competition***

Competition increased markedly in all but the Portland market area, according to both demonstration hospital managers and local competitors. (Portland, Oregon, already was dominated by managed care, even for Medicare patients.) First, hospitals could no longer rely on cost-based reimbursement to cover underutilized open heart services. Second, managed care plans were now very active in all areas. Third, the diffusion of new catheter labs was having profound effects on referral patterns. And fourth, a few local competitors were being very aggressive in their marketing and networking with local physicians.

All demonstration hospitals engaged in direct patient advertising to varying degrees, but **emphasized quality, not lower price**. This was particularly true of the nonacademic medical centers in Atlanta and Ann Arbor that concentrated on building a national reputation (and succeeded). The imprimatur of being a Medicare Participating Heart Bypass Center was marketed heavily as a quality indicator to reassure patients when referred by physicians or managed care plans to their facility. By contrast, the academic medical centers in Boston and Columbus, Ohio, found themselves switching marketing strategies away from the "pursuit of science "to a caring environment." After seeing their bypass market shares fall over the early years of the demonstration, both centers launched more aggressive advertising campaigns.

The nonacademic medical centers were very active building referral networks. Most were purchasing primary care practices in surrounding suburbs. Deans in the academic

hospitals, by contrast, were slow to react to the changing heart bypass surgery market and, for awhile, continued to espouse a "they will come" philosophy. Finally, when volumes dropped precipitously, surgeons and marketing staff convinced them to emphasize clinical care much more. Still, building referral networks for academic hospitals is difficult because of the tensions surrounding admitting privileges and lack of outside physician access to patients once admitted. Recognizing the need to build referring physician relationships, University Hospital opened its cath lab to outside cardiologists.

All hospitals felt they were in a better position to negotiate managed care contracts because of the demonstration. "We have expensed the experience," as one manager put it, implying that the hospital was forced to make the front-end investment in data systems, physician relationships, billing and collection systems, and critical care nurses that was now being put to use in the private market. The nonacademic medical centers had negotiated several global heart contracts with Delta, Prudential, and Aetna in Atlanta, and with First American Bank, and Consumers' Power, Inc., in Ann Arbor. St. Luke's Episcopal Hospital in Houston had already established global payment contracts with Tennaco and several international clients. Weak data systems, high teaching costs, HMOs seeking full service contracts instead of cardiovascular carve-outs, and even resistant surgeons, initially held back the academic medical centers in negotiating bundled rates for heart care. Over the last three years, however, both Boston and Columbus made great strides in managed care contracting.

Interviews with managers and surgeons in academic medical centers (AMCs), both in and outside of the demonstration, highlighted major obstacles they faced in a global budget environment. First, and foremost, AMCs have a teaching and research mission and a cumbersome educational bureaucracy to overcome in responding to a fast-moving market. Years ago, these hospitals were totally dominant in their markets for complex bypass surgery. Today, hundreds of nonacademic hospitals are performing bypass surgery and angioplasty. Indeed, in the majority of demonstration sites, the AMC was not the largest open heart facility. Academic reputation alone is not enough to assure a viable

number of bypass patients. Finally, some academic surgeons are uncomfortable competing for patients by changing practice patterns and lowering costs, which they see interfering with their teaching obligations. This raises the question of who will pay for teaching under a comprehensive managed care system of global budgeting. Nevertheless, by the end of the five demonstration years, both AMCs had made great strides in becoming more competitive.

- ***Physician Payments***

The negotiated global price between the government and the participants was based on separate estimates of Part A hospital and Part B physician outlays. All hospitals began allocating the single payment according to amounts internally agreed upon in their bid. The four major specialties always involved in a bypass admission, namely, **the surgeon, the anesthesiologist, the cardiologist, and the radiologist, all received fixed capitated amounts** regardless of the services provided different patients. Consulting physicians were usually paid their regular allowable Medicare fees out of a set-aside pool in the Part B component. A percentage holdback on payments to the four capitated physicians was used to pay these fees. Any savings on the pool at year's end were returned to them.

The fact that consulting physicians could not bill Medicare directly proved contentious in several sites, especially outside the AMCs where fee-for-service consultations were more common. Surgeons also cut back on their use of consultants, which aggravated them even more. In one site, pulmonologists, neurologists, and other consultants alleged that the quality of care was being compromised. When hospital management asked that they provide evidence of poorer quality, they were unable to do so.

As the demonstration progressed, two important changes took place in physician payments. First, the Congress introduced the Medicare Fee Schedule which had the effect of reducing HCFA payments on the Part B component of the bundled payment. No hospital adjusted their physician payments for the reduction, however, and **physicians under the demonstration were effectively sheltered from fee schedule rollbacks on bypass surgery, catheterization and other overpriced procedures.** Hospitals also made some minor

adjustments in radiologists' payments (downwards) and cardiologists' payments (upwards) for technical reasons or errors in original estimates.

The second change in physician payments came from **sharing in hospital cost savings in the nonacademic medical centers**. In Ann Arbor, St. Joseph Mercy "shared" the savings it realized from changes in surgeon practice patterns by extending them more operating room time and by converting their physician assistants in surgery and nurse specialists into hospital employees. In Atlanta, St. Joseph's Hospital instituted a Cost Reduction Allocation Program that provided bonuses to individual surgeons based on documented savings to the institution. To be eligible, the surgeon had to meet stringent quality and volume criteria. The bonus formula assured every surgeon of receiving at least the originally negotiated payment, thus insulating them from fee schedule rollbacks, plus one-quarter of any hospital cost savings they personally generated.

A final benefit to physicians was the willingness of each hospital to take responsibility for collecting any deductible and coinsurance amounts on both Part A and B. In general, physicians were paid promptly by the hospital upon discharge or within two weeks, except for late billers. **Delays of several months in collecting the coinsurance from supplemental insurers resulted in significant cash flow problems for hospitals instead of physicians.**

- ***Reimbursement Difficulties***

The demonstration involved major changes in reimbursement arrangements. First, providers had to bundle all physician inpatient bills with the hospital bill and submit them to HCFA Central Office for payment. No physician could bill carriers for inpatient services provided demonstration patients. Second, HCFA developed a fixed copay for each patient by hospital and DRG.

Certainly, **the single largest administrative burden for hospitals under the demonstration involved billing and collection**. Most sites significantly underestimated both the effort to assemble a complete package of physician bills and bill the government as

well as trying to collect the supplemental insurance. (Bundling appeared to be a minor problem at St. Luke's because of the previous familiarity of the physicians with global pricing arrangements.) HCFA, the sites acknowledged, made many concessions and contacted many insurers, but the reimbursement changes inevitably required a whole new layer of billing/collection staff and procedures. As costly as it was, one hospital financial manager considered it "expensed experience" that had to be made in order to win private sector contracts of a similar nature.

According to providers and patients, **patients were quite pleased with a single copay amount**. This simplified the payment process. Patients also liked the idea of a bundled copay amount for both hospital and physician services.

Hospitals, in general, were also **pleased with the prompt payment received by HCFA** Central Office, which was done by wire within thirty days. The one difficulty with came with **delays in updating rates for the Medicare Fee Schedule in the first quarter of 1994**. Instead of continuing to pay under the old rates, HCFA stopped paying any discharges from January through mid-April until it established the new rates. This **created a cash flow problem of several million dollars until it was resolved**. HCFA staff recognized the problem and improved its coordination of fee schedule and global payment updates.

Supplemental insurers responsible for paying patient deductible and coinsurance amounts **were uniformly displeased** with the flat actuarial payment calculated by HCFA. It was incompatible with their computer systems that require itemized charges, services, and payments by CPT code. Also, patients differed in their policies in terms of coverages, deductibles, and coinsurance amounts. A flat rate assumed all patients had identical supplemental policies. Many insurers also wanted to pay less when their patients used fewer physician services. One insurer captured the feelings of many other firms by noting that "we didn't agree to participate in the demonstration." While the government has made extraordinary efforts to explain the change to insurers, it still regards the supplemental

payment issue to be a provider problem. In fairness, HCFA explicitly adjusted the Part B copay amounts of the global payment so as to underestimate the average patient obligation.

- ***Achievement of Goals***

Overall participant satisfaction with the demonstration was mixed. Some goals were achieved, some were not. Some hospitals were more successful than others. All sites were hoping to increase their bypass volumes and market shares. That rarely happened. **Several hospitals felt that the government had abandoned them by not actively promoting the demonstration or allowing them to waive patient copays for the uninsured.** Not having a "Centers of Excellence" imprimatur to market further limited their marketing strategies.

On the positive side, **nearly all of the hospitals did sign major new private managed care contracts bundling payment of heart surgery.** By the demonstration's end, all had made the necessary investments in data systems, joint physician contracting arrangements, changes in practice patterns, and new billing systems. The acceptability of bundled pricing to employers and insurers clearly differed across the areas, however. Areas already dominated by full capitation were less responsive to DRG-specific global rates.

Certainly, **the most salient accomplishment of the demonstration was the reduction in hospital costs in three of four hospitals where micro-cost data were analyzed.** As one demonstration manager put it, "we set a target of reducing our bypass costs by $1,000, and we did it." While cost reduction was a goal in most hospitals, there was some skepticism that physicians would change their practice patterns. In three of the four original hospitals, staff were surprised at how quickly physicians were able to reduce lengths of stay, substitute generic for brand drugs, and reduce unnecessary testing and other services. In this regard, surgeon support for the clinical nurse specialists who implemented the critical care pathways was crucial. In the one hospital where surgeons resisted attempts to change practice patterns, costs continued to rise. High costs were much less an issue in the three additional sites, although cost savings were achieved as well through more cost effective practice patterns.

Another goal of hospital staff was to achieve a closer working relationship with their physicians. All hospitals felt they had made progress towards this goal, but tensions remain in some places between surgeons and consulting physicians who have had their referrals reduced. **Aligning physician and hospital incentives, respondents agreed, was key to the change in surgeon attitudes**.

Although quality improvements were never an explicit goal--all hospitals felt they were providing high quality already--nurses and quality assurance directors in most institutions believed that quality had improved. The primary reason was the increased emphasis of surgeons and other physicians on avoiding complications through closer patient monitoring. The fact that complication rates rose slightly during the demonstration is inconsistent with their subjective impressions, however, and may be due to changes in coding or unmeasured increases in patient severity. The heightened activity of Quality Assurance departments may also contribute to more thorough coding of complications during the demonstration.

The one uniform are of dissatisfaction was the difficulties encountered in billing and collection. Nearly all sites felt they should have received extra payments to cover the novel billing arrangements. Now that internal procedures and computer systems are in place, however, these sunk costs are felt to be outweighed by the imprimatur of being a Medicare Participating Heart Bypass Center.

References

Cromwell C, D Dayhoff, NT McCall, *et al.*: *Medicare Participating Heart Bypass Center Demonstration.* Final Report, HCFA Contract No. 500-92-0013, July 1998.

Letsch SW, Lazenby HC, Levit KR, and CA Cowan: National Health Expenditures, 1991. *Health Care Financing Review*. Vol. 14, No. 2. HCFA Pub. No. 03335. Office of Research and Demonstrations, Health Care Financing Administration. Washington. U.S. Government Printing Office, April 1993.

CMS LIBRARY
3 8095 00006111 5